



Looks Small, Performs Big

Technical Manual of Micro Data Center

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Important Note

This manual contains **essential system & safety** information, before beginning any work involving the installation of a MicroDC system, please read this manual.

When installation is complete please keep this manual in a safe and available place.

We recommend that the installation and maintenance of MicroDC systems should only be carried out by suitably qualified personnel who have been trained accordingly.

This product is classed as
“NOT USER SERVICEABLE”

The use of non-recommended spares or parts or attempts at installing or servicing other than described herein will invalidate conformity and any valid warranty.

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Technical Manual of MicroDC

Table of Contents		
	Important Safety Instructions	7
1	Scope	8
2	Pre-installation precautions	9
2.1	Cabinet	9
2.2	Cooling unit	10
2.3	Ethernet	11
2.4	Mains Power Supply Line	12
3.	Installation	12
3.1	Required Setup Equipment	12
3.2	Cabinet Installation	13
3.2.1	Unpacking the MicroDC	13
3.2.2	General Information about Cabinet First Installation or Relocation	16
3.2.3	Internal Mounting Rails	16
3.2.4	Mounting Hardware	17
3.2.5	Bonding Several MicroDCs together	19
3.3	Cooling Unit	19
3.4	Secondary Equipment	21
3.4.1	PDU	21
3.4.2	Fire Suppression	22
3.4.3	Access Control	23
3.4.4	UPS	23
3.4.5	EMS	26
3.4.6	LAN	27
4	Maintenance	28
4.1	Cooling device	28
4.2	Fire Suppression	28
4.3	UPS device	29
4.4	EMS device	29
5	Troubleshooting	30
5.1	Wheels	30
5.2	Cooling	31
5.3	Fire Suppression	32
5.4	Access Control	34
5.5	UPS	35
6	Service Log	37
7	Certificates	38
8	Notes	41
9	Contact Information	41

Important Safety Instructions

This manual contains important instructions that should be closely followed during installation and maintenance of this unit. Read all safety and operating instructions before attempting to operate the MicroDC. Adhere to all warnings on the unit and in this manual. Follow all operating and user instructions.

This product is designed for commercial / industrial use only. This product is not intended for use with life support.

Maximum heat load or weight load must not exceed those shown on the rating label.

Operate this product in an indoor environment at an ambient temperature of 00°C to 60°C with a relative humidity of 20% to 85% (no condensing). Install in a clean environment, free from dust, moisture, flammable liquids, gases, and corrosive substances.

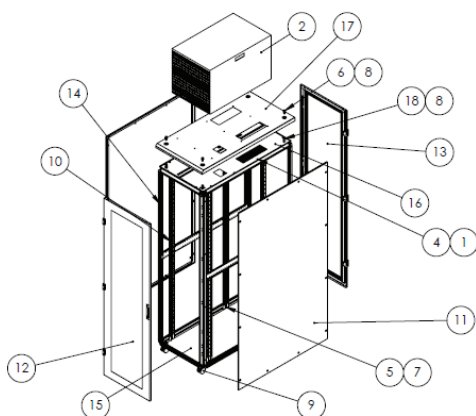
Where applicable, this product must be permanently connected and powered from a suitable single-phase AC supply rated in accordance with the equipment data plate. It must be suitably grounded and protected by a circuit breaker or fuse. A residual current device (commonly known as differential relay) must be present in order to protect any engineer while installing, maintaining or operating the MicroDC.

Ensure the MicroDC has proper ventilation. Never block or insert objects into the ventilation holes or other openings. Maintain a minimum clearance of 500mm in front, rear and top of the MicroDC for proper air flow and cooling.

1 Scope

The scope of this technical manual includes four phases; first it relies on helping the end user arrange / prepare the site where the MicroDC is going to be installed. Second it explains how the MicroDC should be properly handled, installed, connected and operated. Third there is a maintenance guide showing the maintenance procedure needed to be followed in order to extend the MicroDC operating life. Forth there is a troubleshooting guide on how to handle possible misuses or other issues including a detailed FAQ (Frequently Asked Questions) table.

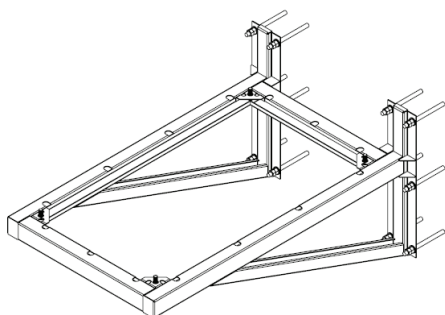
NO.	Part Number	Description	Q
1	00 5009 H 00	Ø5.5x6.5 Bush	42
2	02 5071 H 00	Top Air Condatitioner DEK408TB 492x797x496 mm	1
3	484 00493 AAAB	Ø 50 Plastic Cable Wad	6
4	484 05316 5016	Screw YS8 M5x16 Zinc Coated DIN 7985	42
5	484 05602 0616	Screw IMBUS M6x16 Zinc Coated DIN 7984	8
6	484 05602 1225	Screw IMBUS M12x25 Zinc Coated DIN	4
7	484 10515 1264	Flat Nut Washer M6 Zinc Coated	8
8	484 10515 1294	Flat Nut Washer M12 Zinc Coated	8
9	484 16023 AABA	Sugatsune GX-60-N12S (Wheels)	4
10	020038P01	42U 19" Mounting Rails	4
11	021570M00	IP54 42U 1200 Side Panel Assembly	2
12	021594M00	IP54 42U 600 Glass Front Door Assembly	1
13	021595M00	IP54 42U 600 Solid Rear Door Assembly	1
14	021718M00	42U 600x1200 AC Frame Assembly	1
15	021720M00	600x1200 AC Bottom Assembly	1
16	021721M00	600x1200 4KW AC Top Cover Assembly	1
17	021723B00	600x1200 Head 4kw AC	1
18	S00 00091 BAZC	Head Spacer	4
19	484073335012	Screw M5*12 TSB KOMBI (Torque cylinder head) EJOT	4



2 Pre-installation precautions

2.1 Cabinet

MicroDC cabinet is coming in multiple versions in terms of fixing. This information is usually pre-defined at the ordering procedure. It usually comes as floor standing with or without wheels. This means that you don't have to worry about fixing the cabinet on the floor. The wheels, whenever they are present, they usually help the cabinet to move easily so the system gains a portable character. In such cases that the ordered MicroDC has no wheels, the standing place is very important and should be initially decided, as later on it will be very difficult but also dangerous and not recommended to move.



When the MicroDC is ordered as wall mounted type then there are no wheels attached; instead of wheels there is a specially designed hanging supporter mechanism. This supporter mechanism is used to hang the total cabinet on the wall.

Wall-Mount Enclosures

Foundation wall-mount enclosures are designed to be mounted onto permanent frame structures or building studs. When selecting the installation area for your Foundation wall-mount enclosure, ensure that the structure and the mounting hardware used for the Foundation enclosure are capable of supporting at least 285 lb. (129kg). Refer to the Foundation drawings in the **12.0 - Installation Drawings** for mounting recommendations and precautions.



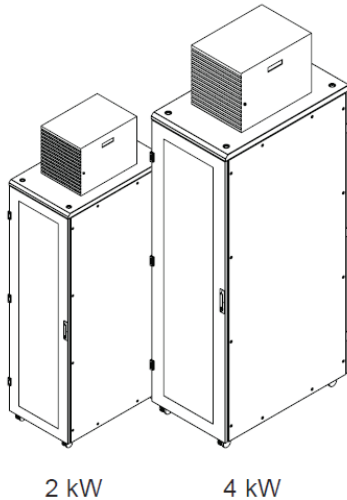
CAUTION

Installer must ensure that the mounting surface and hardware can support the loaded cabinet weight of 285 lb. (129kg). Failure to do so may result in serious injury or death.

Note: *If you have ordered the wall mounted type please refer to the respective installation guide for more information on how to be prepared for the installation on the wall.*

2.2 Cooling unit

Attached to the MicroDC there is an Air-Condition unit. Usually this unit comes on the top of the cabinet and less frequently on the door. This information is usually pre-defined at the ordering procedure. The cooling unit has been already attached onto the cabinet and already cabled.



There are two ways to connect the power feed to the cooling unit. One way is to feed the cooling unit from any existing PDU or IP-PDU inside the MicroDC. This option is used whenever the administrator needs to control or check the power consumption of the cooling unit. But this might stress the PDU or any other equipment since the cooling unit comes in two versions; version one is 2KW cooling capacity, version two is 4KW cooling capacity. The second way is to feed the cooling unit from a dedicated power line from any available electrical distribution panel. It is strongly recommended to use the second option and feed the system by a separated power line.

In chapter 4.3 there is brief explanation on what kind of circuit breaker shall be used but also all technical information in regards to the power consumption / absorbed by the Mains power network.

The condensate which, depending on the ambient temperature and humidity conditions, forms on the exchanger that cools the enclosure air is not a malfunction but a normal phenomenon of the cooling unit. The condensate is taken outside the MicroDC through two special metal tubes, a service tube and an emergency one, located on the side of the cooling unit.



The MicroDC comes with 1,5m + 2,5m length special PVC hoses (12mm inner Ø and 17mm outer Ø dimensions). These pipes should be connected to both two tubes and should be driven to the first available drain (gutter or spout). If the first drain is more than 2 meters away from the MicroDC, then the installer might need to extend these PVC hoses.



Please take great care to choose the most proper position to place your MicroDC. You should choose a well-ventilated place. For example a good choice is inside a room with an open window or inside an air condition room. The MicroDC should not be exposed to any possible drops of water coming from the open window. When the cooling device is operating, the generated noise (mainly coming from the embedded compressor) might be annoying. Please avoid placing the MicroDC close to any infants. Please visit the room where the MicroDC stands quite often (especially after the first installation) to secure that the environmental conditions meet the operating limits.

2.3 Ethernet

According to the MicroDC configuration it might be equipped with active equipment including Ethernet connectivity. In order the administrator user to access remotely that equipment and work out with it either controlling or simply monitor it then a basic LAN port providing at least Ethernet cable cat-5e should be available next to the place that the MicroDC will be installed.



2.4 Mains Power Supply Line

A clean, unloaded and direct single phase power supply line shall be present to supply all the power needed for the equipment to be connected to the MicroDC. This line shall be protected from spikes or surges through protection devices. A residual current device must be present in order to detect ground faults - leakage of current to somewhere other than the neutral and line wires (like the ground wire or a person). This device shall protect any engineer while installing or while maintenance procedures. The line shall be protected by the use of Circuit breakers and fuses to detect short circuits between the line and neutral wires, or the drawing of more current than the wires are rated to handle to prevent overheating and fire. In order to calculate all these devices the installer must be well informed in advance about the total Load of the equipment to be installed to MicroDC. Information regarding the electrical power absorbed by the cooling unit can be found in the Cooling section.

3 Installation

All the installation must be held by professional engineers and previously been trained to properly handle the MicroDC.

Note: The MicroDC is not intended to be used in an occupied office environment, due to potentially high noise levels during the cooling operation. Install the MicroDC in a computer room or in any other room where people are normally present only for maintenance.

3.1 Required Setup Equipment

The following tools are required to set up your MicroDC:

- Pallet jack
- Utility knife
- Allen key number 4 ratchet or wrench
- Torx screwdriver T25 ratchet or wrench

- Measuring tape and pen marker able to write on metal surfaces
- Spirit Level
- hammer
- Flathead and Phillips screwdrivers

3.2 Cabinet Installation

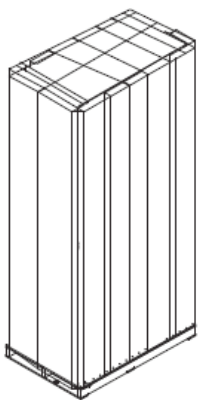
CAUTION:

Be sure to read and understand the documentation that comes with the cabinet for safety and cabling information. Also make sure that you read and understand all the related safety information for all the equipment and review the guidelines in this publication before you install any device into the MicroDC cabinet. Reading and understanding all information reduces the risk of personal injury and or damage to your newly received product.

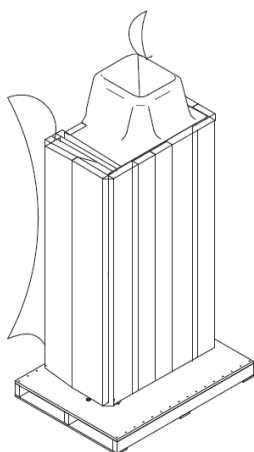
3.2.1 Unpacking the MicroDC

Upon receiving your MicroDC, please examine the packaging for any signs of mishandling or damage. If any damage is noted, shoot some pictures or a short video and then please notify Canovate Group and your carrier as well. Do not attempt to continue the unpacking unless otherwise advised. Remember that the Limited Warranty is not valid whenever a transportation mishandling has damaged the MicroDC.

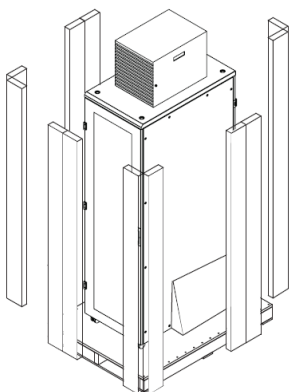
The MicroDC is standing on a wooden pallet. All the way round there are lots of thick cartons used for protection of the cabinet against possible damage to the surface color. Overall these carton vertical lines there is nylon or bubble nylon used for protection against dust, insects or any other small similar intrusions.



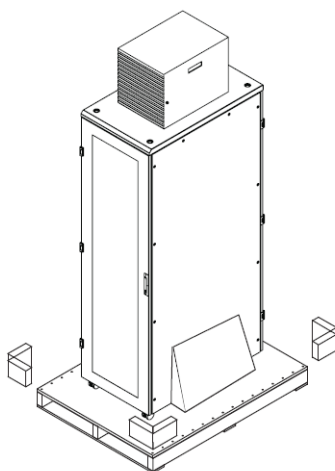
Step 1: Remove all wooden pcs or wooden box (whenever it is present in the packaging contents). You might need to use a Phillips screwdriver and a hammer.



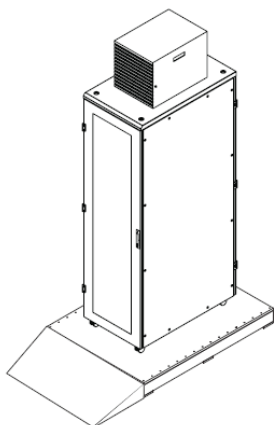
Step 2: Remove the nylon slowly and gently using the utility knife or any other suitable cutting tool; take care not to scratch the color of the MicroDC cabinet.



Step 3: Remove all carton pcs surrounding the MicroDC. Those cartons are loose so there is no need to use any tool at the moment. Please recycle all the carton parts used for the packaging.



Step 4: At all corners of the MicroDC there is a support mechanism in order to avoid the MicroDC from slipping while the transportation. You might need to use a Phillips screwdriver. Locate the wooden ramp standing next to the MicroDC cabinet. You will need this ramp in the next step, to unload the MicroDC from the pallet.



Step 5: Attach the ramp towards the front door of the MicroDC as closest as possible. Release the brakes on the wheels (if available). Then grab the MicroDC gently and carefully slide it down so it can slowly move to the floor. After the MicroDC has left the wooden pallet is ready to be placed at its final position.

Note: Known the weight and size of the MicroDC, it is possible that the MicroDC may tip over while moving. The MicroDC must be removed from the shipping crate using a minimum of 2 people. The MicroDC may not be tipped more than 10 degrees, either from a level surface or rolling down an incline (ramp).



≥ 18 kg (39.7 lb)
< 32 kg (70.5 lb)



≥ 32 kg (70.5 lb)
< 55 kg (121.2 lb)



≥ 55 kg (121.2 lb)
< 100 kg (220.5 lb)

CAUTION:

Use safe practices when lifting.

3.2.2 General Information about Cabinet First Installation or Relocation

MicroDC Relocation: Observe the following precautions when you need to relocate your rack:

- Before you add or remove drawers, always take precaution preventing the MicroDC from moving.
- Always install drawers / equipment at the bottom of the MicroDC first.
- Always remove drawers / equipment from the top of the MicroDC first.
- Always install the heaviest drawers on the bottom of the MicroDC.
- Never push on the sides of the rack as this may shake the MicroDC and make it dangerous.

Note: If you have ordered the wall mounted type please refer to the respective installation manual for more information on how to install it on the wall.

3.2.3 Internal Mounting Rails

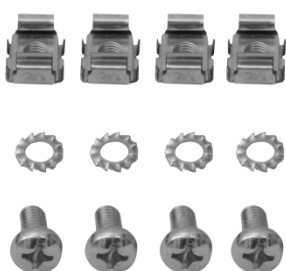
The MicroDC can accommodate rack-mounted or free-standing computer and network equipment. Depending on the model, the unit features either 19-inch to 21-inch (483 or 533mm) rack rails. These internal mounting rails will be either center-mount rails or front- and rear-mount rails that are designed in accordance with the EIA 310D or EIA 310E rack standard. Both types are adjustable for equipment of different sizes.

Mounting hardware compatible with front and rear-mount rails includes a fixed shelf, fixed rails, a pullout shelf, 21-inch to 19-inch (533 to 483mm) rack rail adapters and keyboard trays. Each of these optional kits is supplied with installation hardware (such as all appropriate screws, nuts, bolts or spacers).

There are two pairs of mounting rails inside the MicroDC, the front pair and the rear pair. The distance in between the 2 vertical rails in a single pair is fixed and previously agreed while ordering the MicroDC (either 19 inches or 21 inches). But the distance in between the 2 pairs is not fixed and can be manually adjusted. In order to adjust it you will need to move, i) the front pair, ii) the rear pair or iii) both front and rear pairs. Each pair consists of two vertical rails. Each vertical rail is fixed on the rack cabinet of MicroDC by the use of 2 or 3 screwing points, depending on the height of the MicroDC. Use the Allen key size 4 to unscrew the (M6x12) screws positioned either on the top or to the bottom of the MicroDC. In case your MicroDC is a 42U edition, it includes a center fixing point (side support rail inside the MicroDC cabinet) then by the use of the Torx key size T25 you can unscrew the (M5x12) positioned on the side support rail. Each vertical rail must be individually repositioned. Prior moving the rails, determine the proper location of the rails; take the marker and the measuring tape and draw a short line on the desired fixing position at both ends of each rail. You may also use the spirit level to double check your rails vertical alignment. Double check all fixing points should be tight enough as they will support all equipment in your MicroDC.

Note: Take care to shut down all active equipment before moving the mounting rails. This will prevent the installer from any injuries, such as electrical shock.

3.2.4 Mounting Hardware



Optional mounting clip nuts and screws are available for mounting equipment to the mounting rails. Clip nuts are a clip with a captive nut that fits over vertical rack rail holes, allowing individual placement of the mounting hardware. Each clip nut and screw package includes 10 clip nuts (Type 10/32 or M6 threaded holes) and screws.

When loading the MicroDC the user is able to select which HU (“HU” refers to Height Unit or just “U” refers to Unit; it is the unit of measurement for defining the vertical space used by your server and 1U is equivalent to 4.445 cm or 1.75 inches) will choose for the equipment that is going to be installed. The MicroDC has a unique feature to assist on this task. The mounting rails have specially printed numbers on the surface of the vertical rail. The numbering is either counting from top to bottom or the other way round. Hence the user can easily select which numbering position to place the equipment without the need of any extra tool such as a ruler or a spirit level.

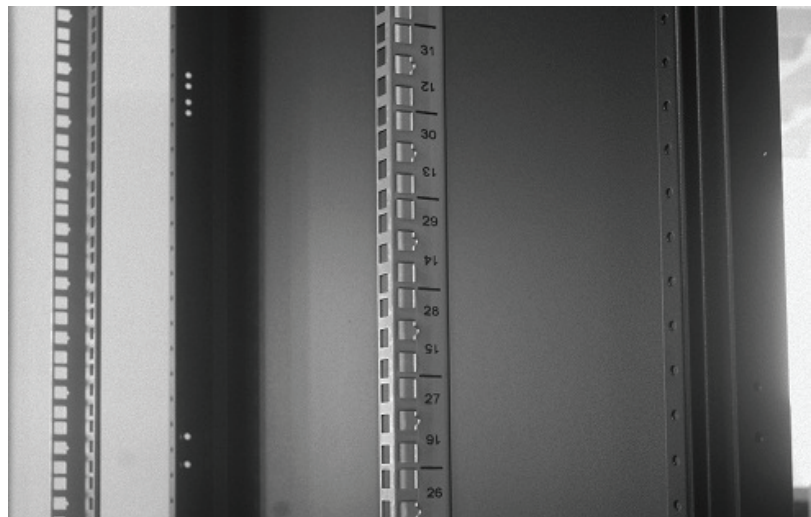
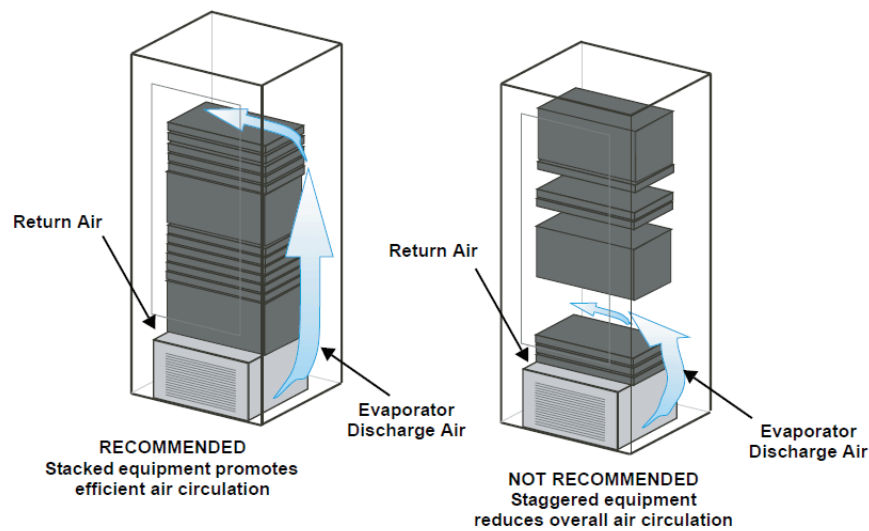


Figure 1 Recommended equipment stacking arrangement



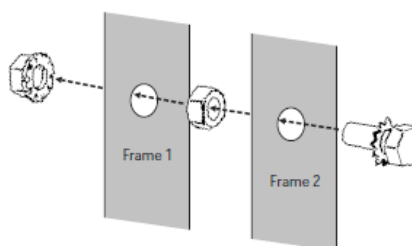
3.2.5 Bonding Several MicroDCs together

Cluster Configuration

Two or more Foundation units can be connected into a cluster, enabling you to keep several pieces of equipment together.

To connect two units:

1. Remove the side panels from the sides of the units that will be bolted together (see 5.9.1 - Remove a Panel).
2. Find the holes for the four bolts that will connect the units. These holes are at the corners of the Foundation, near the panel retainers.
3. Place a star washer on each of the four bolts and insert the bolts into the bolt holes.
4. Put a jam nut on each bolt and tighten them.
5. Remove the side panel bracket from the bottom of both frames.
6. Slide the Foundation units together with the bolts inserted into the connection holes.
7. Put a Keps nut on each bolt and tighten securely.



3.3 Cooling Unit

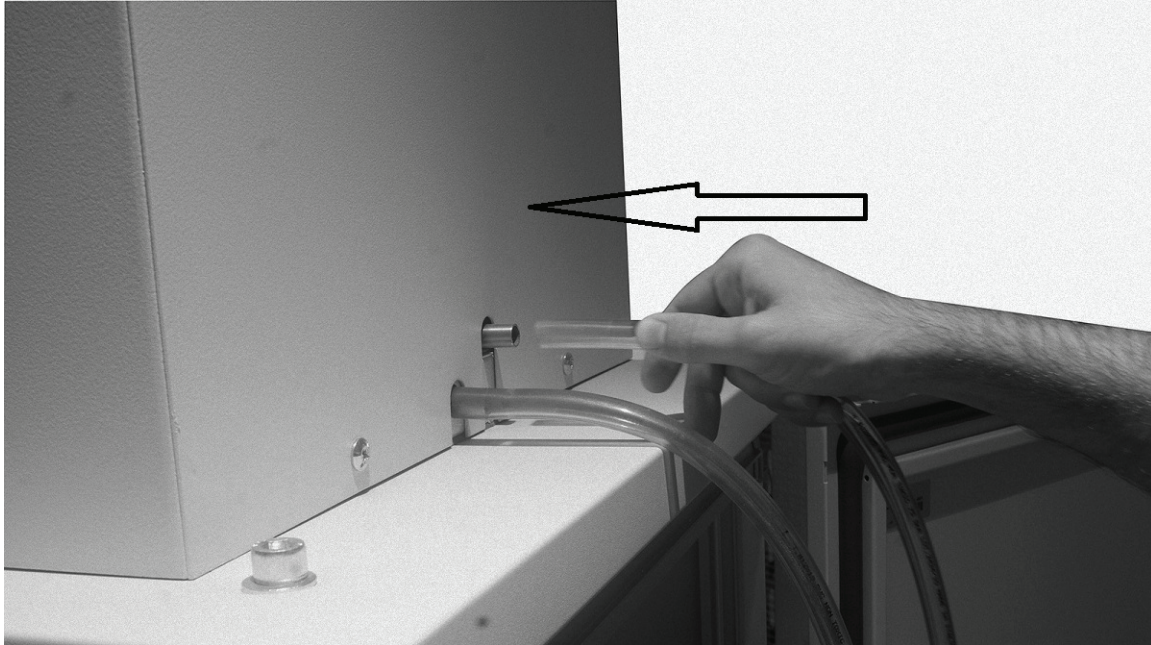
2KW edition: According to the technical datasheet of the Air-Condition Unit, the maximum absorbed power is 1300W which makes a current around 6 Ampere. As per the manufacturer a fuse of 10A-16A rated shall be used. Please pay attention this circuit breaker must be rated tripping B with equal or more than 4.5KA short-circuit capacity. The input plug for the Air-Condition Unit is user selectable while ordering the MicroDC; we usually use the (German) Schuko plug unless the end user demands a specific one.

4KW edition: According to the technical datasheet of the Air-Condition Unit, the maximum absorbed power is 1950W which makes a current around 9 Ampere. As per the manufacturer a fuse of 20A-25A rated shall be used. Please pay attention this circuit breaker must be rated tripping B with equal or more than 4.5KA short-circuit capacity. The input for plug for the Air-Condition Unit is user selectable while ordering the MicroDC; we usually use the (German) Schuko plug unless the end user demands a specific one.

After connecting the cooling unit to the Mains Power then it is ready and operational. There is no embedded switch so after turning the external circuit breaker to ON position then the cooling device will start immediately. The factory temperature setting is usually at 35 degrees Celsius.

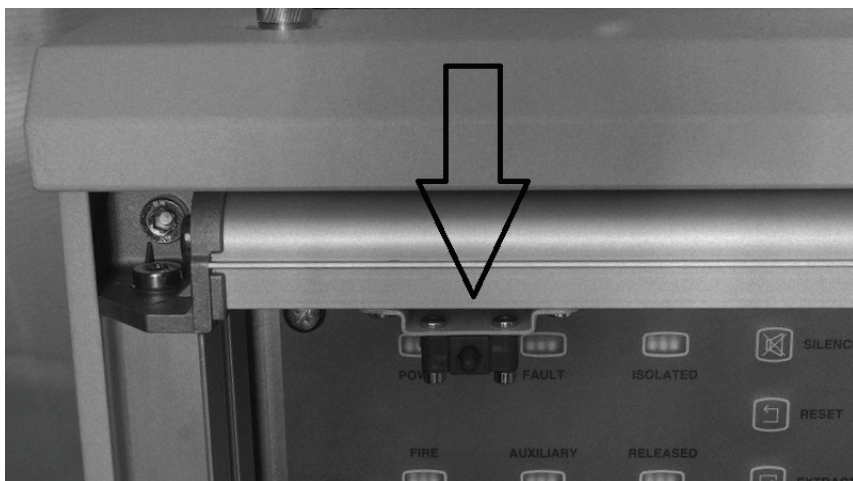
Note: Please refer to the respective user manual of the cooling unit for detailed information on how to operate and interfere to the default settings.

Inside the MicroDC there are two plastic hoses. They fit to the Air-Condition Cooling Unit, at rear and outside of the MicroDC. These are used for any condensation water may be produced. These pipes should be driven to the first available drain (gutter or spout). Please avoid using a bowl as it may be flooded and overflown!



The Air-Condition itself has a built in heat exchanger for the proper work of its cooling cycle. Whenever the compressor is running on, it exchanges heat in between the air of the room and itself. Thus the installer should choose the proper placement for this MicroDC i.e. close to an open window or in a well-ventilated position.

A special door contact is used onto the front door of the MicroDC to control the compressor of the cooling unit. Whenever the front door opens, a signal is generated, the cooling system is able to sense this signal and the compressor of the cooling unit shuts down. This mechanism is preventing the system to aimlessly waste energy trying to cool the system while the front door is open; whenever the door opens then cold air comes out of the MicroDC and the other way round, hot air may come into the MicroDC (considering that the environment temperature is higher than the cooling set point). After the door is closed again there is a timer waiting for 5 minutes (in order the heat inside the MicroDC to be equally stabilized) and then the system lets the compressor run again until the MicroDC temperature reaches the administrator set point.



Whenever the door is open there is display information blinking on the cooler LCD display showing “CA” message, referring to Critical Alarm.



Note: Please refer to the respective user manual of the cooling unit for any more detailed information on how to operate and setup the cooling unit.

3.4 Secondary Equipment

3.4.1 PDU

Canovate offers a big variety of PDUs (Power Distribution Units); they are available in single-phase but also three-phase power input options. The units may be used in 120V, 208-240V or 230V applications, with almost every type of connectors including NEMA or IEC type; they are available in basic type, metered and with or without remote monitoring and individual receptacle control.

The PDU (whenever available) comes preinstalled into the MicroDC. Usually it is fed by the UPS system and allows all equipment to be directly connected to it.

Note: *You might need to use some specific adaptor if the equipment power cable does not meet the PDU outlet types.*

The PDU comes either in 19 inches version (horizontal placement) or 0U version (vertical placement). This information is usually pre-defined at the ordering procedure.

Note: *Please refer to the respective user manual of the PDU for any more detailed information on how to use or setup the PDU.*

3.4.2 Fire Suppression

The Fire Suppression System (whenever this is available) is already mounted inside the MicroDC. It usually occupies the first mounting positions on the top of the MicroDC. It occupies 2U. All connections are already done by the factory. But there are some critical steps that the user must follow in order to activate the system.

- A. Ensure that the special key is inserted and switched to ISOLATE position.
- B. Plug the mains lead into the AC supply and in to the rear of the unit. When initially plugged in the unit will carry out a self-check which will initiate all lamps and give off a tone sound.
- C. At this stage the batteries are NOT in circuit and require the battery link to be inserted into rear panel terminal block.
- D. Take the green terminal block from the contents packet and plug it into the terminal block at the rear of the Fire Suppression Unit; the rated end of line (E.O.L.) resistors is already fitted.
- E. Let the Fire Suppression Unit soak for a few seconds and ensure that fire indications are NOT lit and that EXTINGUISHANT RELEASE button is NOT lit.
- F. The key switch should be turned to the ENABLE CONTROLS position and reset button pressed.
- G. The POWER light should be the only indication lit and the buzzer should be silent.
- H. The key switch may now be returned to the NORMAL position.

Your MicroDC is now self-protected against fire.

Note: *Please refer to the respective user manual of the Fire Suppression system for more detailed information on how to operate and annually maintain the Fire Suppression system.*

3.4.3 Access Control

Concerning the configuration of the MicroDC there might be one or two keypads in the front and rear door respectively. These keypads are used in order to unlock the front or rear door. It gives the user the ability to unlock the cabinet door using the key or with a keyless entry feature. With an optional device the system may be connected to any available LAN and being able to real time monitor all actions but also log. By the use of specific software the user is able to assign users and codes.

Note: Please refer to the respective user manual of the Access Control system for detailed information on how to operate and setup the Access Control system.

3.4.4 UPS

The Uninterruptible Power Supply (UPS) can provide your electronic equipment with:

- Surge protection and suppression
- Regulated voltage and frequency (in regards to the local standards and limits)
- Battery backup

A UPS protects your sensitive electronic equipment when utility power fails. It gives you time to perform a controlled shutdown of your operating system, preventing damage to the hardware, as well as allowing you to save valuable data.

Before plugging in your electronic equipment, make sure that all power switches are in the OFF position.

NOTE: The UPS's batteries may require recharging before it can fully supply your equipment's power needs for the rated time if utility power fails. To charge the UPS batteries before using the unit, you can apply power to the UPS module while you are installing your equipment or while making adjustments. This will allow the batteries to be charged and ready for the first use of your MicroDC.

It is strongly recommended not to feed the cooling unit from the UPS; this might stress the UPS considering the total available output power but also during a mains utility failure shall stress the batteries with the additional load. The UPS power capability and the batteries backup time is predefined at the ordering procedure of the MicroDC.

3.4.4.1 UPS Switching ON

Following there are several steps on how to switch the unit ON or OFF.

Step 1: Switch on the Input CB first and then the Battery CB (when available). Press and hold the ON/OFF button until a warning beep sound, meanwhile observe the normal LED is on (Figure 3.1).

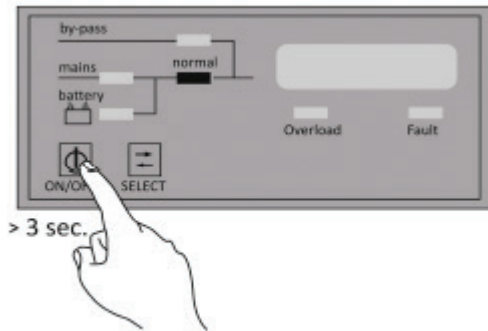


Figure 3.1

Step 2: If the mains voltage and the frequency are within the limits, the mains and the by-pass LEDs will be on (Figure 3.2). If they are out of the limits, the Fault LED will be on and a warning beep will be heard (Figure 3.3).

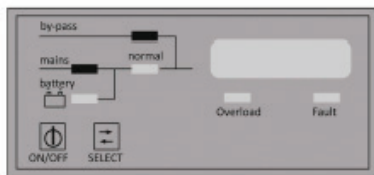


Figure 3.2

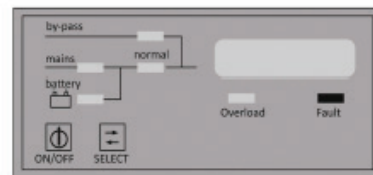


Figure 3.3

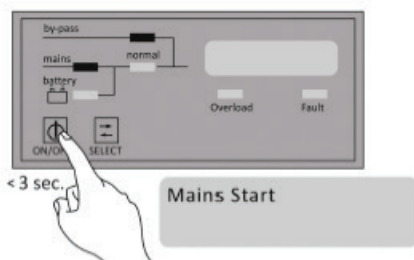


Figure 3.4

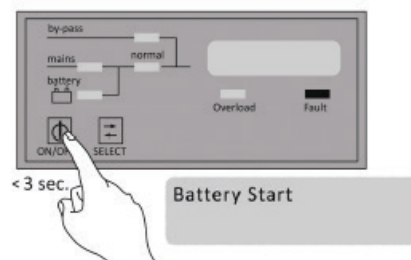
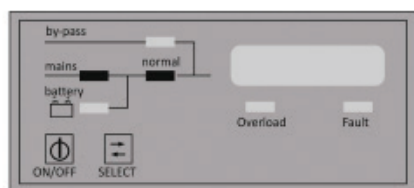


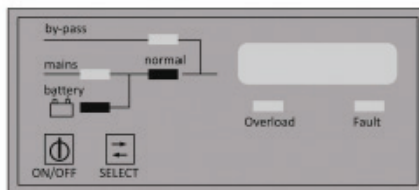
Figure 3.5

Step 3: If the mains and the by-pass LEDs are on, press the ON/OFF button shortly and observe the 'Mains Start' warning (Figure 3.4). If the Fault LED is on, press the ON/OFF button shortly to turn off the audible warning, press shortly again to see 'Battery Start' warning (Figure 3.5) and wait until normal LED is on.

Step 4: If the UPS started on mains voltage, LEDs will be on as shown in (a), otherwise they will be on as shown in (b) (Figure 3.6). In this case, you can switch on Output CB and supply your loads from the UPS (when available).



(a)



(b)

Figure 3.6

3.4.4.2 Switching OFF

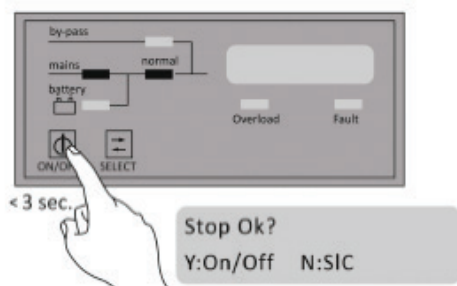


Figure 3.7

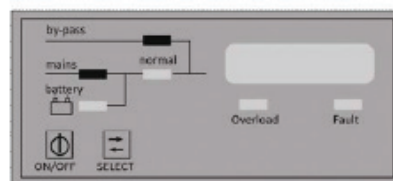


Figure 3.8

Alternative 1: Considering the UPS is in Normal Mode: Switch off all of your loads safely first. Then press the ON/OFF button briefly. Press the ON/OFF button briefly again to confirm bypass operation and observe the by-pass and the mains LEDs turn on (Figure 3.7, Figure 3.8).

Note: The UPS must be operated in bypass mode prior to fully switching off after normal mode.

Alternative 2: Considering the UPS is in Bypass Mode: Press and hold the ON/OFF button until the warning beep silences (Figure 3.9). Observe that the display screen is fully switched off.

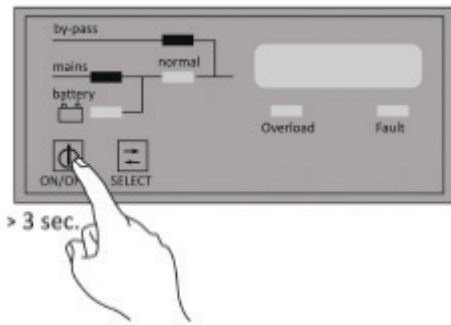


Figure 3.9

Alternative 3: Considering the UPS is in Battery Mode: Press and hold the ON/OFF button until warning beep silences (Figure 3.10). Observe that the display is fully switched off.

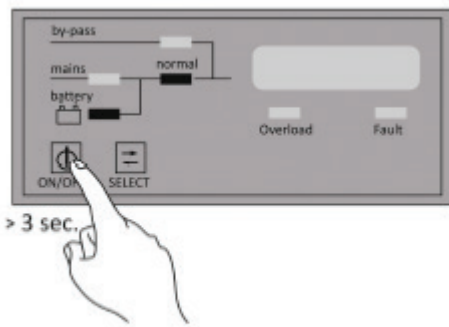


Figure 3.10

While trying to switch off the unit, always remember to switch off the output, the battery, and the input CBs in respective order.

Note: Please refer to the respective technical manual of the UPS system for any further detailed information on how to operate and setup the UPS.

3.4.5 EMS

The EMS (Environmental Monitoring System) usually comes preinstalled whenever it has been ordered. The EMS consists of two parts. The first part is the hardware part, with part number DC100 and the second part is the software part, named as DCIMexpress. Multiple sensors are available and preinstalled and preconfigured to the DC100. The DC100 occupies 1HU and it comes in 19 inches version fitting the 19

inches rack. Below there is some brief information for suitable sensors usually used depending on the configuration of the MicroDC.

Door Sensors: This option consists of one or two normally open switches that are mounted on the cabinet's front and/or rear frame supports. The switches will indicate the position of the doors as opened or closed. This is determined by the status of the dry-contact inputs connected to the DC100. The user may read the door open or close status through the DCIMexpress software.

Temperature Sensors: This option allows monitoring of temperature status by the DC100. There is one, two or up to 4 temperature measuring sensors located inside the MicroDC. The user may read the temperature through the DCIMexpress software.

Combo Temperature and Humidity Sensors (with LCD screen): This option allows monitoring of temperature and humidity status by the DC100. There is a combo temperature and humidity sensor located inside the MicroDC. The user may read the temperature and humidity directly from the big LCD screen or through the DCIMexpress software.

Water Detector: This option allows sensing the presence or not of any liquid inside the MicroDC, such as water or any other unwanted liquid type. The water detector is a dry contact sensor. The sensor doesn't need power to operate eliminating the possibility of malfunction or break down. The user may read the liquid presence or not through the DCIMexpress software.

Smoke Detector: This option allows a smoke sensor to be attached on the inside top of the MicroDC and monitors the presence or not of smoke through the DC100. The user may read the smoke presence or not through the DCIMexpress software.

Note: *in case there is Fire Suppression unit inside the MicroDC then the smoke sensor is usually not used since there is already this sensor embedded inside the Fire Suppression Unit.*

Note: *Please refer to the respective user manual of the EMS system for any detailed information on how to operate and setup the DC100 and the DCIMexpress software.*

3.4.6 LAN

If the ordered devices include Ethernet port then an Ethernet switch should be used and various Ethernet patch cords in order to connect each device to the switch. The default IP-address of each device included in the configuration of the MicroDC can be easily accessed from a sticker already been used right next to the Ethernet port. The Installer can easily trace, find and collect all IP-addresses. You might need to connect a computer in order to access these devices such as

the Fire Suppression, Access Control, UPS, EMS or any other connected device.

4 Maintenance

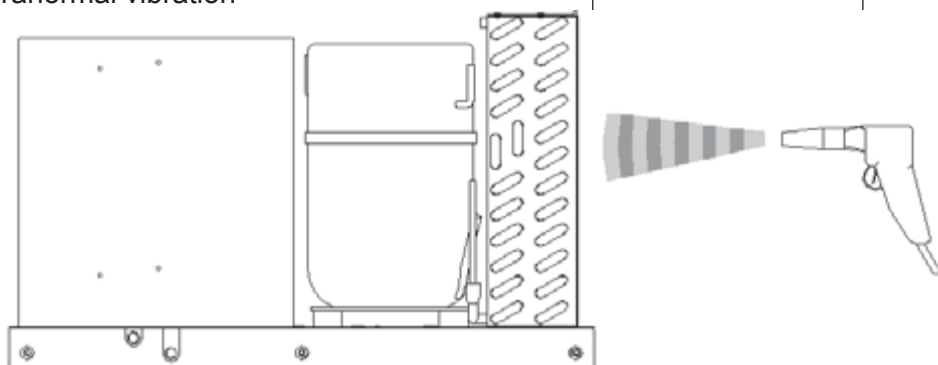
One of the biggest advantages of the MicroDC is the very low maintenance cost needed in order the system to operate and function as brand new. The MicroDC consists of various devices so each device must be separately handled and interpret.

4.1 Cooling device

Caution! Before embarking on any maintenance work, switch current off of the cooling unit.

The cooling unit is a low maintenance type; so no filter change is required. The main job that regularly needed to be done is to blow the internal components with compressed dry air at a maximum pressure of 4 bars; the following also shall be checked regularly:

Job	Frequency
Check the external air to air heat exchanger and clean if necessary	Every 3 months
Check effectiveness of the condensate discharge hose to check whether it has been blocked or not	Every 3 months
Check the fans for any overheating signs or paranormal vibration	Every 6 months



Any repairs that may need doing must only be done by specialized and authorized personnel and only by the use of original spare parts.

4.2 Fire Suppression

The fire suppression should be quite often checked either following the local country's laws / directions or following the

specific Fire Suppression Technical Manual directions. There are two types of inspection that needed to be followed. The User check is a basic mostly like a visual inspection; the Engineer check is more professional and must never be omitted.

Job	Frequency
Perform a self-check of the control circuitry by pressing the reset button with key switch being in ENABLE CONTROLS position.	Every 1 month
Check effectiveness of the condensate discharge hose to check whether it has been blocked or not	Every 3 months
Check the fans for any overheating signs or para-normal vibration	Every 6 months

4.3 UPS device

Caution! The UPS should only be opened by authorized personnel.

The UPS must be completely off during maintenance. Mains and battery connections must be disconnected and batteries must be moved away from the UPS.

Follow the 'Important Safety Information' and 'Installation' instructions during the maintenance found on the respective manual.

Job	Frequency
Clean the electronic boards and the fans.	Every 6 months
Clean the ventilation holes on the lid.	Every 6 months
Clean the UPS body with a soft and moist cloth.	Every 3 months
Check the sturdiness of cable connections, screws and sockets.	Every 6 months
Measure and check the board supply voltages.	Every 12 months
Check the components on the boards and the other hardware.	Every 12 months
Measure all the voltage of the batteries separately.	Every 6 months
Check the accuracy of the calibration and the adjustments.	Every 12 months
Check the dust, the heat and the temperature inside the room that the MicroDC stands.	Every 1 month

4.4 EMS device

The EMS system is a monitoring system. Thus the only maintenance needed is the following; all sensors must be triggered in order to generate an alarm. This error simulation

will enable all alerting methods that have been previously preconfigured.

Job	Frequency
Simulate all alarms by triggering all available sensors in the MicroDC.	Every 6 months

5 Troubleshooting

This is the troubleshooting guide.

5.1 Wheels

Malfunction	Conditions	Causes	Remedy
The MicroDC can hardly or even not able to move	It is very difficult the movement of MicroDC	The version does not include wheels	Please unload the MicroDC to become lighter and then relocate the standing position
		The wheels are dirty	Clean the wheels by removing all attached dust and dirt. You may use a lubricant spray as well
		The brakes (where available) are preventing from sliding	Release the brakes and then try to move the MicroDC once again

5.2 Cooling

Malfunction	Conditions	Causes	Remedy
the unit fails to cool	No component works	No electricity getting to the unit.	This is not a malfunction of the cooling unit. • Make sure the power cable has been connected well to the terminals. • Check that the cubicle doors and switches are closed
	The internal fan works, the external fan and compressor do not work.	The temperature inside the enclosure is lower than what is set on the adjustment thermostat.	This is not a malfunction of the cooling unit. To verify functioning when testing, lower the thermostat setting until the compressor and external fan start working and then reset the thermostat.
		The adjustment thermostat has failed	Change the adjustment thermostat
		The antifreeze thermostat has failed	Change the antifreeze thermostat
	Compressor, external and internal fan work	Cooling unit empty of fluid	Call a refrigeration expert or the Canovate's Technical Assistance Service
		Compressor mechanical failure	Call a refrigeration expert or the Canovate's Technical Assistance Service
	Compressor and external fan work, internal fan does not work External and internal fan work, compressor does not work	Internal fan capacitor failed	Change the internal fan's capacitor
		Internal fan failed	Change the internal fan
		Compressor's amperometric protector failed (external to the compressor, where present)	Change the amperometric protector
		Relay or PTC for compressor starting failed	Change the relay or PTC for compressor starting
		Capacitor for compressor starting failed (where present)	Change the capacitor for compressor starting
		Compressor motor electrical failure	Call a refrigeration expert or the Canovate's Technical Assistance Service
		High pressure safety switch failed	Call a refrigeration expert or the Canovate's Technical Assistance Service
		Compressor contactor failed (where present)	Change the contactor

It is not cooling enough	External and internal fans work, compressor works all the time	Cooling unit under sized for the heat dissipated inside the enclosure	Change the cooling unit with another of greater capacity
	Inside fan works, external fan and compressor work irregularly	Antifreeze thermostat triggered (where present)	<ul style="list-style-type: none"> • Clean the evaporator coil • See if there are any obstacles inside the enclosure to hinder the flow of recycling air
Too much condensate forming	External and internal fans work, compressor works irregularly	Insufficient gas in the cooling unit	Call a refrigeration expert or the Canovate's Technical Assistance Service
	Enclosure door open	Thermostat set point incorrect	Check thermostat set point
	Enclosure door closed	High pressure safety switch triggered: <ul style="list-style-type: none"> • Ambient temperature over the maximum working limit • Heat exchanger coil (condenser) either dirty or clogged 	<ul style="list-style-type: none"> • Ventilate the premises where the enclosure is installed to keep ambient temperature lower. • Clean the exchanger with compressed air and detergent
		Thermal protector inside the compressor triggered: <ul style="list-style-type: none"> • Ambient temperature over the maximum working limit • Heat exchanger coil (condenser) either dirty or clogged 	<ul style="list-style-type: none"> • Ventilate the premises where the enclosure is installed to keep ambient temperature lower. • Clean the coil with compressed air and detergent
		Too much ambient air inside the enclosure	This is not a malfunction of the cooling unit. Close the enclosure door or disable the cooling unit
		Enclosure protection level is below IP54	This is not a malfunction of the cooling unit. Seal enclosure openings, i.e. for passage and upward path of wires
		The enclosure/cooling unit connecting seal has been fitted incorrectly	Check seal and remedy

5.3 Fire Suppression

Malfunction	Conditions	Causes	Remedy
Battery Fault	Fault signal is detected from the power supply (battery failure)	The battery is disconnected	Check batteries are in circuit
		The rear connector is disconnected	Check on rear external connector block
		The battery has failed due to lifetime or improper environmental conditions	Check batteries for signs of malfunction – corrosion, overheating, and shape distortion. Replace the batteries

Power Supply Fault	Fault signal is detected from the power supply (mains failure)	There system has run out of Mains Power	Check all external fuses and that the main supply is present, also check fuse on PSU PCB
24v Output Fuse	24v Output Fuse issue has been detected	Open circuit across fuse FH1	Check fuse and replace after determination / remedy of fault
Zone 1 Fault	Zone 1 Fault has been detected	Open or short circuit fault is detected from detection circuit no. 1	Check detector 1 is situated on base correctly, if no other detectors are being used check that 6.8k end of line resistor is connected on terminal block (Z1) If other external detectors are being used check that they are all in place and that all are situated on the bases correctly, also check that the end of line resistor is in place on the last detector
Zone 2 Fault	Zone 2 Fault has been detected	Open or short circuit fault is detected from detection circuit no. 2	check detector 2 is situated on base correctly, if no other detectors are being used check that 6.8k end of line resistor is connected on terminal block (Z2) If other external detectors are being used check that they are all in place and that all are situated on the bases correctly, also check that the end of line resistor is in place on the last detector
Hold Circuit Fault	Hold Circuit Fault has been detected	Open or short circuit has been detected on hold circuit	Check end of line resistor is in circuit 6.8k on terminal block (hold), rear connection block is securely in place, any external wiring has end of line resistor fitted
Abort Circuit Fault	Abort Circuit Fault has been detected	Open or short circuit has been detected on abort circuit	check end of line resistor is in circuit 6.8k on terminal block (abort), rear connection block is securely in place, any external wiring has end of line resistor fitted
Extinguishant Circuit / Actuator Circuit Fault	Extinguishant Circuit / Actuator Circuit Fault has been detected	open circuit has been detected on the extinguishant circuit	Ensure that internal extinguishing actuators are in circuit, if fault persists they should be changed, external ensure that the extinguishing actuators are in circuit
Extinguishant Released Circuit Fault	Extinguishant Released Circuit Fault has been detected	Open or short circuit has been detected on released circuit	Check end of line resistor is in circuit 6.8k on terminal block (RLS'D), rear connection block is securely in place, any external wiring has end of line resistor fitted

Pressure Monitor / Auxiliary Circuit Fault	Pressure Monitor / Auxiliary Circuit Fault has been detected	Open or short circuit has been detected on pressure monitor circuit	Check end of line resistor is in circuit 6.8k on terminal block (LP), rear connection block is securely in place, any external wiring has end of line resistor fitted
Isolate	Isolate Mode is a warning	Key switch is in isolate mode, this is to warn that the unit is now disarmed, this is shown as a fault code	Turn Key Switch to either Enable Controls Or Normal position

5.4 Access Control

Malfunction The MicroDC door cannot be unlocked from the Access Control system	Conditions pressing the button there is no audible tone	Causes the access control system is out of power	Remedy use the old fashion basic key to open the MicroDC door and plug the access control system into power
	there is audible tone but the system is not accepting the user code	the user code used is wrong	enter the correct user code

5.5 UPS

Malfunction	Conditions	Causes	Remedy
UPS won't switch on	All LCD and LEDs are off	ON/OFF button is pressed very briefly. Input CBs are switched off None of the above	Press and hold ON/OFF button for at least 3 seconds Switch on the CBs in appropriate order Call a UPS expert or the Canovate's Technical Assistance Service
UPS operates in Battery Mode only	'Battery Mode' warning received	Problem with cable connections CB failure Mains voltage or frequency is out of limits None of the above	Check input cable connections Check the input CB Check the mains voltage and the frequency on the front panel. Call a UPS expert or the Canovate's Technical Assistance Service
UPS is ON but also failure light is ON and the UPS gives consequent audible warning	The UPS may be giving 'Over Heat Rec' warning	The ambient temperature inside the MicroDC is high	Check the UPS load ratio and the environment temperature. Shut down the UPS and wait for a while
	The UPS may be giving 'Over Heat Inv' warning	The UPS temperature is high	Check the UPS load ratio and the environment temperature. Shut down the UPS and wait for a while
	The UPS may be giving 'Battery High' warning	Wrong amount of connected batteries	Call a UPS expert or the Canovate's Technical Assistance Service
	The UPS may be giving 'Over Current' warning	The connected load requested a peak more than the UPS is being capable of	Turn the UPS off and on
	The UPS may be giving 'Output S/C' warning	There is a possible short circuit or some connected load drained too much current in a very short time	Shut down the UPS. Make sure there is no short circuit on loads before switching the UPS back on
	Other warning type	None of the above	Call a UPS expert or the Canovate's Technical Assistance Service
Overload light is ON and UPS gives consequent audible warning	'Over Load' warning	The Load is exceeding the UPS capability	Check the load ratio. Reduce the loads connected to the UPS output

Time for running on battery is too low	The UPS when running on Batteries after a short time is turns off	<p>Batteries were not fully re-charged before going to Battery Mode</p> <p>Possible battery charger failure</p> <p>Possible battery failure</p>	<p>Check back again once the batteries were recharged for at least 8 hours</p> <p>Call a UPS expert or the Canovate's Technical Assistance Service</p> <p>Call a UPS expert or the Canovate's Technical Assistance Service</p>
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6 **Service Log**

Any changes, modifications, and repairs to the system or its components are to be noted on these pages. All recordings must contain date and signature of the qualified engineer.

Date of Installation:
.....

Installation Completed by:
.....

On Behalf of: (Company):
.....

Date	MicroDC serial num- ber	Problem Detected	Action	Signature

7 Certificates

Certificate of Compliance

Certificate Number 20110121-SA33417
 Report Reference SA33417, 2011 January 21
 Issue Date 2011 January 21

Page 1 of 1



Issued to: PAVARINI COMPONENTS SPA

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 46020 PEGOGNAGA MN ITALY

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- > 2006/42/EC : Directive Machines
- > 2004/108/EC : Electromagnetic Compatibility
- > 2006/95/EC : Low Voltage Directive

Norme di riferimento - Unit reference normative - Bezugsnormen - Normes de reference - Normativas de referencia

- > UNI EN ISO 12100 : Safety of machinery
- > EN 60335-1, -2-40 : Electrical appliances-safety
- > EN 61000-6-1, -6-2, -6-3, -6-4 : Electromagnetic Compatibility
- > CEI EN 60204-1 : Electrical equipment of machinery
- > UNI EN 378 : Refrigerating systems and heat pumps
- > CEI EN 60529 : IP Code
- > UNI EN ISO 3744 : Determination of sound power levels of noise sources using sound pressure.

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- Furthermore it is stipulated that Govi Alessio in quality of Director and depositary of the technical dossier of the company "PAVARINI COMPONENTS S.p.A." is responsible for the production and the follow up of the technical manual.

- Darüber hinaus wird darauf hingewiesen, dass der Unterzeichnende Govi Alessio als Geschäftsführer der Firma "PAVARINI COMPONENTS S.p.A." mit Sitz in der verantwortlich zu schaffen und bewahren die technischen Unterlagen ist.

- En outre, il est stipulé que Govi Alessio, en qualité de administrateur et dépositaire du dossier technique de la société "PAVARINI COMPONENTS S.p.A." est responsable de la rédaction et du suivi du manuel technique.

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CANOVATE GROUP MICRO DATA CENTER PRODUCTS

Canovate ® warrants its ALL SERIES of products by providing to the original consumer purchaser, a LIMITED WARRANTY for a period of ONE-YEAR from the original date of purchase. Should ALL parts of MICRO DATA CENTER products fail due to defects in material or workmanship under normal use within this ONE-YEAR period, Canovate Group will, at its own discretion, repair or replace the defective part.

This warranty does not cover products which are misused, abused, mishandled, improperly installed, improperly stored, changed, modified, or are subjected to extreme temperatures or extreme moisture levels. This warranty is not valid for products used for any purpose other than the purpose for which they were originally intended.

This warranty does not cover the cost of installation, removal, subsequent damage, or transportation of the defective product, regardless of whether work was performed by a contractor, Service Company or yourself.

In addition, all accessories such as sensors, panels, doors, shelves, separators, cable organizers etc. in the manufacture of Canovate products are also warrantied by Canovate Group. Foreign parts that are used-made by a different manufacturer such as cooling fans (heat exchanger) are subject to be covered it's own manufacturer. This warranty is passed to the original consumer purchaser by Canovate Group from the manufacturer and is subject to the conditions as outlined in paragraph two and three above.

THIS WARRANTY IS THE EXCLUSIVE WARRANTY OF CANOVATE GROUP AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. IN NO EVENT SHALL CANOVATE GROUP BE LIABLE FOR CONSEQUENTIAL, INDIRECT OR INCIDENTAL DAMAGES RESULTING FROM THE INSTALLATION, USE, OR FAILURE OF ITS PRODUCT.

To submit a claim under this warranty, contact the headquarter of Canovate Group, or send a letter explaining the defect, with a dated sales receipt as proof of purchase to (do not send merchandise unless requested by the Quality Department):

Quality Department

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